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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,698	01/22/2002	Masaharu Shioya	02029/LH	7841

1933 7590 08/27/2003

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NEW YORK, NY 10017-2023

EXAMINER

KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 08/27/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

10/053,698

Applicant(s)

SHIOYA, MASA HARU

Examiner

Stephen J. Kalafut

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1745

-- The MAILING DATE of this c mmunication appears on the c ver sheet with the correspondence address --
Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-23 is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is confusing because it requires the presence of either the fuel pack (a) or the power generation module (b), or both, but describes the power generation module in terms of its being connectable to the fuel pack. If the fuel pack is not present, however, determining whether a power generation module is connected thereto would be impossible. Claims 2-18 depend from claim 1 and would likewise be indefinite. Claim 17 is confusing because it recites gas being fed "to said fuel pack", but the fuel pack appears, within these claims, to be the source of the gas used in a fuel cell, rather than a receptacle for the gas.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Emelock (US 4,597,363).

Emelock discloses a fuel cell system which includes a fuel pack (11) which is charged with oxalic, a liquid which contains hydrogen, which is then changed to formic acid in a reforming portion (12), and finally to hydrogen and carbon dioxide (column 2, line 53 through column 3, line 2). The gases pass through a CO₂ absorber (13), which removes some of the CO₂, thus taking first gas from the reforming portion, and making a second gas lower in CO₂ content

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than the first gas, and passing the second gas into a fuel cell (14). The absorber may comprise a slurry of calcium hydroxide (column 3, lines 1-3). Since conduits carry the gas from one stage to the next, the fuel pack and power generation module are considered attached to each other.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Matsushita (Japanese 09-204,925).

Matsushita discloses a fuel cell system, which includes a fuel pack (8) which is attached to a power generation module, which includes a reformer (2) and a fuel cell (1), via a pair of CO₂ absorbers (3). Since the fuel is reformed to hydrogen gas, the original fuel would contain hydrogen, albeit contained in larger hydrocarbon molecules. The CO₂ absorbers would take a first gas from the reformer, and then pass a second gas into the fuel, the second gas having a lower CO₂ content than the first gas.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Emelock or Matsushita, each in view of Scheifers *et al.* (US 5,723,229).

These claims differ from each of Emelock and Matsushita by reciting a water collection portion, which collects water produced by the fuel cell, this portion also being separate from the

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CO₂ absorber. Scheifers *et al.* disclose a portable fuel cell device (10), which includes a water collector (46), which takes water from the fuel cell (13) itself. Because the fuel cells of Emelock and Matsushita each produce water, by reacting hydrogen with oxygen, and because the water trap of Scheifers *et al.* would allow the water to be either stored or released (column 3, lines 6-15), it would be obvious to use a water collector as shown by Scheifers *et al.* with the fuel cells of either Emelock or Matsushita.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsushita in view of Clingerman *et al.* (US 6,376,112).

Matsushita does not specifically mention the reforming reactions or devices in which they are carried out, such as the conversion of CO to CO₂ by aqueous shift or selected oxidation, or vapor reformation. Clingerman *et al.* disclose a fuel cell with a reforming system, which includes the water gas shift ("aqueous shift") and preferential oxidation ("selected oxidation") reactions (column 1, line 61 through column 2, line 19). Since liquid methanol is contemplated as a raw fuel, its vaporization would also be implied. Since these reactions would reduce the content of detrimental CO, and produce CO₂, which may be absorbed, it would be obvious to use the water gas shift, preferential oxidation, and vapor reforming reactions of Clingerman *et al.* in the fuel cell system of Matsushita.

Claims 2 and 4-11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art applied above, or cited either below

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or by applicants, does not disclose a fuel cell system which includes a CO₂ absorption device which either has a variable volume or contains a calcium carbonate collection portion.

Claims 19-23 are allowed. The prior art also does not disclose a device which includes a fuel charged portion and one or more by-product absorption components, at least one of which has a variable volume.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Winsel (US 3,785,870), Healy *et al.* (US 4,751,151), Aoyoma (EP 0 700 107) and Kitami *et al.* (Japanese 60-200,470) disclose various CO₂ absorbers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 703-308-0433. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 703-308-2383. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

sjk


STEPHEN W. AND
PRIMARY EXAMINEE
GROUP
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